



On the Latitudinal Dependence of Geomagnetic Storm Dynamical Complexity: An Empirical Mode Decomposition Approach.

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During geomagnetically disturbed periods the Earth's magnetosphere shows a very complex dynamical character, which manifests in scaling and intermittent magnetic field fluctuations at the smallest timescales. The aim of this work is that of investigating the latitudinal dependence of complexity degree of the short timescale geomagnetic field fluctuations during four intense magnetic storms occurred between 2000 and 2003. This work is based on the analysis of the fluctuations of the horizontal component of the Earth's magnetic field measured at nine permanent geomagnetic observatories approximately with the same magnetic longitude and magnetic latitude ranging between 49N and 87N. We filter the signal via Empirical Mode Decomposition (EMD) and successively apply the Permutation Entropy (PE) analysis. The results point toward a latitudinal dependence of the complex character of geomagnetic field fluctuations indicating the different nature of the processes and phenomena responsible for the observed complex dynamics